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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/777,866 | 02/11/2004 | Marc O'Donnell Schweitzer | 008834 | 6117 |
| 61285 7590 07/13/2006 | | | USA/CPS/IBSS/LAP | |
| JANAH & ASSOCIATES, P.C. 650 DELANCEY STREET, SUITE 106 SAN FRANCISCO, CA 94547 | | | EXAMINER CHAUDHRY, SAEED T | |
| | | | ART UNIT | PAPER NUMBER |

1746

DATE MAILED: 07/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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|------------------------------|--------------------------------------|------------------------------------------|--|
| Office Action Summary | Application No. 10/777,866 | Applicant(s) SCHWEITZER ET AL. | |
| | Examiner Saeed T. Chaudhry | Art Unit 1746 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 April 2006.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 5-28 is/are pending in the application.
 4a) Of the above claim(s) 12-28 is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1,2 and 5-11 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Applicant's amendments and remarks filed April 27, 2006 have been acknowledged by the examiner and entered. Claims 3 and 4 have been canceled and claims 1-2, 5-28 are pending in this application for consideration. Of the above 12-28 are withdrawn from consideration in view of restriction requirement.

Applicant's election with traverse of Group I, claims 1-11 in the reply filed on April 27, 2006 is acknowledged. The traversal is on the ground(s) that Group II, claim 21 include immersing the surface. This is not found persuasive because Group I, claim 1 does not require to grit blasting as claimed in claim 21.

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made

The factual inquiries set forth in *Graham v. John Deere Co.*, 148 USPQ 459, that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or unobviousness.

Claims 1-4, 6, 9 and 10 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Sasaki et al in view of Barton et al.

Braton et al (3,934,379) disclose a method for removing a layers of organic material build up on a support for articles during surface coating by applying a liquefied inert gas such as nitrogen to the support, which cause embrittlement of the material and then separating the

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embrittled material (see abstract). The embrittled material is separated by blasting with a particulate abrasive material at a high velocity. To change the temperature of the surface can be performed by immersing the surface in liquefied gas or spraying liquefied gas on the surface (see claims 1-13, col. 3, lines 12-65, col. 4, lines 27-42). The reference fails to clean a surface of a substrate processing chamber component.

Sasaki (6,214,130) discloses a method for cleaning the inside of a pipe in a semiconductor device fabricating machine, wherein the semiconductor device fabricating machine having the heat-treating pipe is a CVD chamber by supplying liquid nitrogen to the pipe, wherein the cooling effect by the temperature of the liquid nitrogen itself having a boiling point -197°C and a boiling of the liquid nitrogen, contaminant adhered to the inside of the pipe is peeled off and removed away. The cooling effect causes the contaminant to contract so that an adhering force of the contaminant drops because of a difference in thermal expansion coefficient between the contaminant and a material of the pipe (see col. 1, lines 7-13, 54 through col. 3, line 11). The inorganic contaminant are Na, Fe and Cu (see col. 2, lines 64-65). The temperature of the surface inherently below -40°C because the boiling temperature of the nitrogen is -197°C and the thermal expansion coefficient of the surface is at least 2 times to the thermal coefficient of the contaminants. Sasaki et al fails to disclose immersing the surface in liquid nitrogen or spraying the surface with the liquid nitrogen or grit blasting or heating the surface after cooling or a texture surface.

It is well known in the art of cleaning that surfaces having different material have different thermal expansion and contraction as disclosed by Sasaki and Braton et al. Therefore, it would have been obvious at the time applicant invented the claimed process to utilizes the

process of immersing or spraying liquefied inert gas and blasting as disclosed by Braton et al into the process of Sasaki for the purpose of sudden change in the temperature by immersing or spraying. Spraying and immersion are interchangeable because both have given the same results. Further, one of ordinary skill in the art would use a blasting step after cooling the surface for the removal of the material as disclosed by Braton et al to enhance the removal of the material from the surface. Further, one of ordinary skill in the art would expect that this process would be effective to remove material from a texture surface also if the coefficients of the thermal expansion and contraction is different for material and the surface.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki in view of Barton et al as applied to claim 1 above, and further in view of Sakurai et al.

Sasaki and Barton et al were discussed supra. However, the references fail to use ultrasonic agitation.

Sakurai et al (6,082,373) disclose a method for removing material from a surface by immersing the substrate in a bath of nitrogen and applying ultrasonic vibration to the bath, which consequently remove impurities adhering to the surface of the substrate (see col. 5, line 54 to col. 6, line 3) .

It would have been obvious at the time applicant invented the claimed process to incorporate ultrasonic vibration as disclosed by Sakurai et al into the processes of Sasaki and Barton et al to enhance the removal effect with ultrasonic vibration. One of ordinary skill in the art would expect that removal of embrittled material would be interchangeable with blasting or ultrasonic vibration.

Claims 6, 7-8 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Sasaki in view of Klee et al.

Sasaki was discussed supra. However, the reference fails to disclose immersing the surface in liquid nitrogen or grit blasting or heating the surface after cooling or a texture surface.

Klee et al (4,627,197) disclose a method for removal of adherent coatings from articles by cryogenic embrittlement of the coatings and blasting of the embrittled coatings with impact media, wherein a chamber is initially cooled down progressively to a supercold preset temperature level considerably below that required for embrittlement of the coatings. The blasting is continued for a fixed time period; during part of the blasting time the temperature of the chamber is permitted to rise to a second temperature level (see abstract). The second preset temperature is 25 to 100 F (see claims).

It would have been obvious at the time applicant invented the claimed process to incorporate the cited steps of blasting and heating the surface as disclosed by Klee et al into the process of Sasaki for the purpose to remove the contaminated material from the surface. One of ordinary skill in the art would increase the temperature after cooling with liquid nitrogen to reduce the consumption of liquid nitrogen as disclosed by Klee et al. Further one of ordinary skill in the art would manipulate the temperature of surface for better and efficient results.

Claim 11 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Sasaki in view of Hatano.

Sasaki was discussed supra. However, the reference fails to disclose that the surface of the chamber is stainless steel.

Hatano (5,954,887) discloses that the CVD apparatus 2 has a process chamber made of stainless steel (see col. 3, lines 52-55).

It is well known in the art that the CVD chamber are made of stainless steel as disclosed by Hatano. Therefore, one of ordinary skill in the art would expect that Sasaki process would remove contaminants from the stainless steel chamber surfaces because Sasaki process disclosed to remove contaminants from the surface of the CVD chamber pipe.

Response to Applicant's Arguments

Applicant argued that there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine the teachings of the different references. Second there must be a reasonable expectation of success for such a combination.

This argument is not persuasive because both the references Sasaki and Barton et al concerned in the removal of the organic material from the surface. Therefore, both the references are in the inventor field of endeavor. Further, Both the references are using liquefied gas to embrittled the contamination on the surface for cleaning. Therefore, one of ordinary skill in the art would expect that by spraying or immersing or flowing the liquefied gas over the surface would have give the same results.

Applicant argued that Sasaki does not teach immersing the surface of the component in a fluid or spraying the surface of the component with fluid as claimed. Instead, Sasaki teaches applying nitrogen into the inside of the pipe to cause the contaminant adhered to the inside of the pipe to peel off. The nitrogen gas blows off the contaminants residues from the pipe sidewalls while they are subjected to thermal stress. In contrast, the present process comprises the steps of immersion of the component in the fluid, or spraying fluid onto the surface to the component, to cause the component surface to reach low temperature, which cause the residue material to fracture and flake off from the component surface.

This argument is not persuasive because Sasaki disclose to contact the nitrogen liquid to the pipe surface and Barton et al disclose to contact the surface by immersion or spraying. Therefore, one of ordinary skill in the art would contact the surface by immersion or spraying which are equivalent to the flowing over the surface, which would reduces the temperature of the components eventually.

Applicant argued that Barton et al is non-analogous art because Barton et al is an industrial process to remove organic residue that build up in the application of the surface finishes or surface treatments to parts. In contrast, the present claims are to a substrate cleaning process performed in the art of semiconductor fabrication.

This argument is not persuasive because both the references are concerned with removing organic material from the surface. Therefore, both are in the same technical field.

Applicant's argument that Klee et al teaches the non-analogous art of removing flash from molded articles and paint and other coatings is not persuasive because claimed process and Klee et al both are using cryogenic to reduce the temperature of the coating or contaminant on the surface. Therefore, Klee et al is in the same technical endeavor.

Applicant's arguments filed April 27, 2006 have been fully considered but they are not persuasive.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Saeed T. Chaudhry whose telephone number is (571) 272-1298. The examiner can normally be reached on Monday-Friday from 9:30 A.M. to 4:00 P.M.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Michael Barr, can be reached on (571)-272-1414. The fax phone number for non-final is (703)-872-9306.

When filing a FAX in Gp 1700, please indicate in the Header (upper right) "Official" for papers that are to be entered into the file, and "Unofficial" for draft documents and other communication with the PTO that are for entry into the file of the application. This will expedite processing of your papers.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (571) 272-1700.

Saeed T. Chaudhry

Patent Examiner

MICHAEL BARR
SUPERVISORY PATENT EXAMINER

MICHAEL BARR
SUPERVISORY PATENT EXAMINER

A handwritten signature in black ink, appearing to be 'Michael Barr', written over the printed name and title.